Cisco UCS 9108 100G Intelligent Fabric Module

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https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-x-series-modular-system/datasheet-listing.html

Overview

The Cisco UCS 9108 100G Intelligent Fabric Module (IFM) brings the unified fabric into the blade server enclosure, providing connectivity between the blade servers and the fabric interconnect, simplifying diagnostics, cabling, and management.

The Cisco UCS 9108 100G IFM connects the I/O fabric between the 6536 Fabric Interconnect and the Cisco UCS X9508 Chassis, enabling a lossless and deterministic converged fabric to connect all blades and chassis together. Because the fabric extender is similar to a distributed line card, it does not perform any switching and is managed as an extension of the fabric interconnects. This approach removes switching from the chassis, reducing overall infrastructure complexity and enabling Cisco UCS to scale to many chassis without multiplying the number of switches needed, reducing TCO, and allowing all chassis to be managed as a single, highly available management domain.

The Cisco UCS 9108 100G IFM also manages the chassis environment (power supply, fans, and blades) in conjunction with the fabric interconnect. Therefore, separate chassis-management modules are not required.

The IFM plugs into the rear side of the Cisco UCS X9508 chassis. The IFM provides a data path from the chassis compute nodes to the Cisco UCS 6536 Fabric Interconnect. Up to two Intelligent Fabric Modules (IFMs) plug into the back of the Cisco UCS X9508 chassis.

The IFMs serve as line cards in the chassis and multiplex data from the compute nodes to the Fabric Interconnect (FI). They also monitor and manage chassis components such as fan units, power supplies, environmental data, LED status panel, and other chassis resources. The server compute node Keyboard-Video-Mouse (KVM) data, Serial over LAN (SoL) data, and Intelligent Platform Management Interface (IPMI) data also travel to the IFMs for monitoring and management purposes. In order to provide redundancy and failover, the IFMs are always used in pairs.

There are 8 x QSFP28 external connectors on an IFM to interface with a Cisco UCS 6536 Fabric Interconnect. The IFM internally provides 1 x 100G or 4 x 25G connections towards each UCS X210c Compute Node in the Cisco X9508 chassis.

When a compute node is inserted into the chassis, the compute node's mezzanine card (mLOM) connects to the IFMs using orthogonal direct connectors. *Figure 1* shows the IFM front view characteristics.
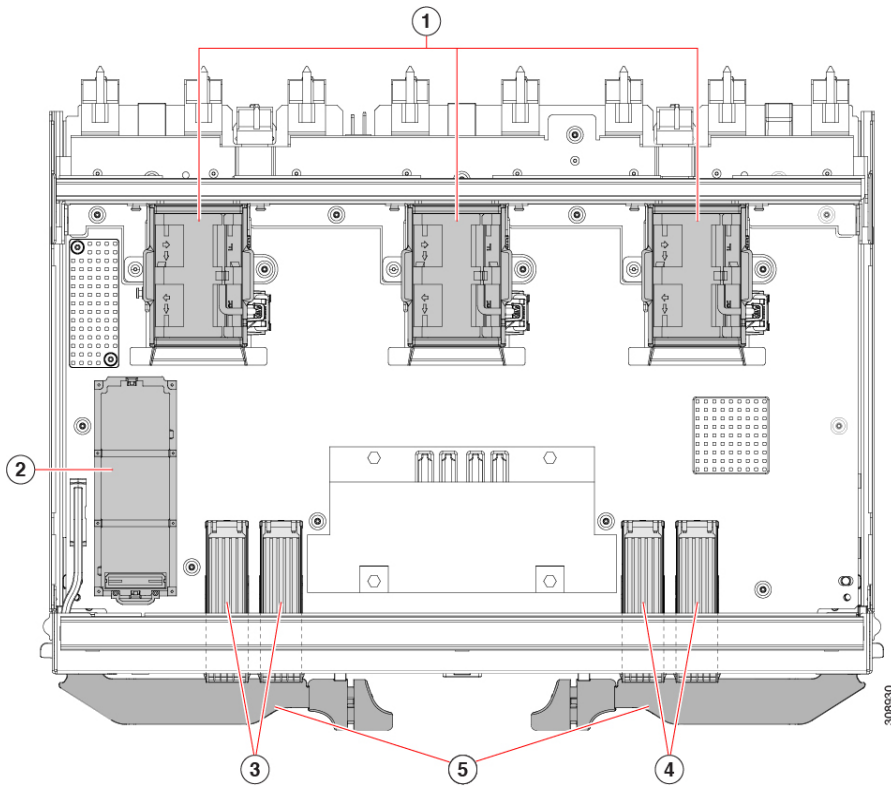
Figure 1   **Cisco UCS 9108-100G IFM (front view)**
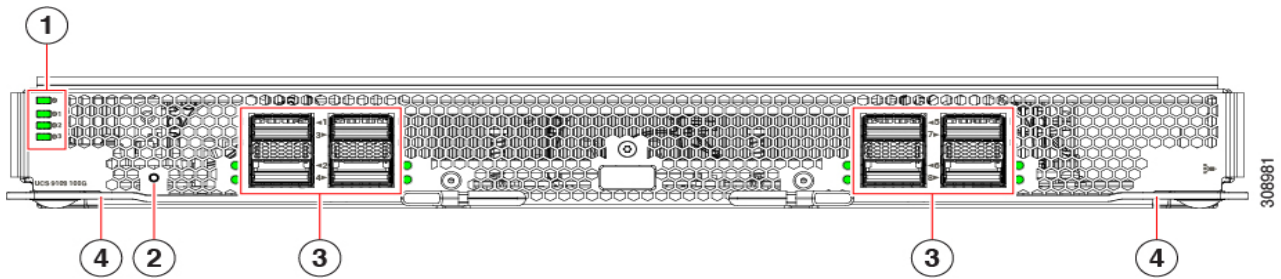
1	Status LEDs: - IFM Status (top LED) - Fan Status LEDs 1 through 3, with Fan 1 as LED 2, Fan 2 as LED 3, and Fan 3 as LED 4.	2	IFM Reset Button
3	QSFP28 Optical Ports. Ports are arranged in two groups of four physical ports. Ports are stacked in vertical pairs, with two ports in each vertical port stack.	4	IFM Ejector Handles, left and right

Figure 2 shows the IFM top view characteristics.

Figure 2   Cisco UCS 9108-100G IFM (top view)

1	Fans (3) which are numbered 1 through 3 starting with the left fan	2	One M.2 mini storage module slot
3	QSFP28 Optical Ports 1-4 Ports are arranged in two groups of four physical ports. Ports are stacked in vertical pairs, with two ports in each vertical port stack.	4	QSFP28 Optical Ports 5-8 Ports are arranged in two groups of four physical ports. Ports are stacked in vertical pairs, with two ports in each vertical port stack.
5	IFM ejector handles, left and right	-	

LED Indicators

The LED indicators are described in *Table 1* (see *Figure 1 on page 4* for LED locations)

Table 1   IFM LED States

LED	State	Description
IFM Status	OFF	Power OFF
	GREEN	Normal Operation
	AMBER	Booting or minor Temperature Alarm
	BLINKING AMBER	Stopped in uboot or unable to come online, or major temperature alarm
FAN status LED # 1, 2, 3	OFF	Power OFF
	GREEN	Normal Operation
	AMBER	Fan fault (low fan speed or fan not running)
QSFP Port LED status 1 LED per port per color	OFF	Link enabled but not connected
	GREEN	Link connected
	AMBER	Operator disabled
	BLINKING AMBER	Disabled due to error

Cisco UCS 9108 100G IFM

Capabilities and Features

Table 2 lists the capabilities and features of the Cisco UCS 9108 100G Intelligent Fabric Module. Details about how to configure the IFM for a particular feature or capability are provided in *CONFIGURING the INTELLIGENT FABRIC MODULE (IFM) on page 9*.

Table 2   Capabilities and Features

Capability/Feature	Description
Server data path bandwidth	800 Gb/s for 8 compute nodes (1 x 100 Gb/s or 4 x 25 Gb/s lanes per compute node, for a total of 100 Gb/s per compute node)
Network data path bandwidth	800Gb/s 100 Gb/s per port x 8 QSFP28 ports
CPU complex	■ Intel® Denverton Processor (4 core, 2.2GHz, 15W) ■ DDR4 memory: 8GB max @ 2133 MHz
Fibre Channel	FCoE
Fans	The IFM has three dual-rotor on board fans. The air flow direction is aligned with chassis air flow direction, which is front to rear. The IFM Fans have minimum RPM requirements to be compatible with the chassis/system main fans. The fans are powered from 54VDC/48VDC. Fan speed is controlled and monitored by the IFM CPU using a fan controller IC.
Power Supply	Power supplied by chassis
Power consumption	237W
Cisco Intersight Management	■ Allows all elements connected to the interconnects to participate in a single, highly available management domain
Unified Fabric	■ Decreases total cost of ownership (TCO) by reducing the number of NICs, HBAs, switches, and cables needed ■ Transparently encapsulates Fibre Channel packets into Ethernet ■ Increases flexibility with a range of interconnect solutions, including copper Twinax cable for short runs and fiber for long runs ■ Consumes less power per port than traditional solution
Fabric Extender Architecture	■ Scales without adding complexity by eliminating the need for dedicated chassis management and compute nodes and by reducing the number of cables needed ■ Provides deterministic latency for optimized application performance
QSFP28-compatible ports	Allows the 8 fixed ports to operate in 100 Gigabit Ethernet mode with the transceiver options specified for use with QSFP28-compatible ports in *Table 4 on page 11*. The QSFP28 ports on the IFM are bound to a port-channel towards the fabric-interconnect and any number of links between 1 thru 8 could be active on this port-channel between FI and IFM.

Table 2   Capabilities and Features *(continued)*

Capability/Feature	Description
Transceivers	The Cisco UCS 9108-100G IFM supports 100G connectivity using Cisco 100 Gbps modules.
Performance	■ Provides high-speed, low-latency connectivity to the chassis ■ Provides approximately 50% reduction in end-to-end system latency (latency is less than 1 microseconds)
Lossless Fabric	Provides a reliable, robust foundation for unifying LAN and SAN traffic on a single transport
Priority Flow Control (PFC)	■ Simplifies management of multiple traffic flows over a single network link ■ Supports different classes of service, helping enable both lossless and classic Ethernet on the same fabric
Systemwide Bandwidth Management	Helps enable consistent and coherent quality of service (QoS) throughout the system

CONFIGURING the INTELLIGENT FABRIC MODULE (IFM)

Follow these steps to configure the Cisco UCS 9108 100G IFM:

STEP 1   VERIFY INTELLIGENT FABRIC MODULE SKU

Verify the product ID (PID) of the IFM as shown in *Table 3*.

Table 3   Available Intelligent Fabric Modules

Product ID (PID)	Description	Number of 100 GbE/FCoE Ports to ToR	Number of Internal GbE/FCoE Ports	Total Chassis I/O per IFM
M6				
UCSX-I-9108-100G	UCS 9108 100G IFM for X9508 chassis	8	8 x 100G or 32 x 25G or a combination of 100G and 25G depending on the VIC 15000/14000 series in the compute node.	3.2 Tbps
M7				
UCSX-I9108-100G-D	UCS 9108 100G IFM for X9508 chassis	8	8 x 100G or 32 x 25G or a combination of 100G and 25G depending on the VIC 15000/14000 series in the compute node.	3.2 Tbps

NOTE: Use the steps on the following pages to order the Intelligent Fabric Module with the components that you want configured in your order.

STEP 2   CHOOSE TRANSCEIVERS (OPTIONAL)

The Cisco UCS 9108 100G IFM supports a wide variety of 100 Gigabit Ethernet connectivity options using Cisco 100 Gbps modules.

Choose Transceivers

The supported transceivers are for the UCS 9108 100G IFM are listed in *Table 4*.

Table 4   UCS 9108 100G Supported Transceivers

Product ID (PID)	Description
QSFP28 100G Transceivers	
QSFP-100G-SR4-S	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF
QSFP-100G-LR4-S	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF
QSFP-40/100-SRBD	100GBASE/40GBASE SR-BiDi QSFP Transceiver, LC, 100m over OM4 MMF
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C
QSFP-100G-SL4	100GBASE SL4 for up to 30M over OM4 MMF
QSFP-100G-DR-S	100G QSFP28 Transceiver 100GBASE-DR, 500m SMF, duplex, LC
QSFP-100G-FR-S	100G QSFP28 Transceiver 100G-FR, 2km SMF, duplex, LC
QSFP-100G-SR1.2	100G SR1.2 BiDi QSFP Transceiver, LC, 100m OM4 MMF
QSFP28 100G Cables with Integrated Transceivers	
QSFP-100G-CU1M	100GBASE-CR4 Passive Copper Cable, 1m
QSFP-100G-CU2M	100GBASE-CR4 Passive Copper Cable, 2m
QSFP-100G-CU3M	100GBASE-CR4 Passive Copper Cable, 3m
QSFP-100G-CU5M	100GBASE-CR4 Passive Copper Cable, 5m
QSFP-100G-AOC1M	100GBASE QSFP Active Optical Cable, 1m
QSFP-100G-AOC2M	100GBASE QSFP Active Optical Cable, 2m
QSFP-100G-AOC3M	100GBASE QSFP Active Optical Cable, 3m
QSFP-100G-AOC5M	100GBASE QSFP Active Optical Cable, 5m
QSFP-100G-AOC7M	100GBASE QSFP Active Optical Cable, 7m
QSFP-100G-AOC10M	100GBASE QSFP Active Optical Cable, 10m
QSFP-100G-AOC15M	100GBASE QSFP Active Optical Cable, 15m
QSFP-100G-AOC20M	100GBASE QSFP Active Optical Cable, 20m
QSFP-100G-AOC25M	100GBASE QSFP Active Optical Cable, 25m

Table 4   UCS 9108 100G Supported Transceivers *(continued)*

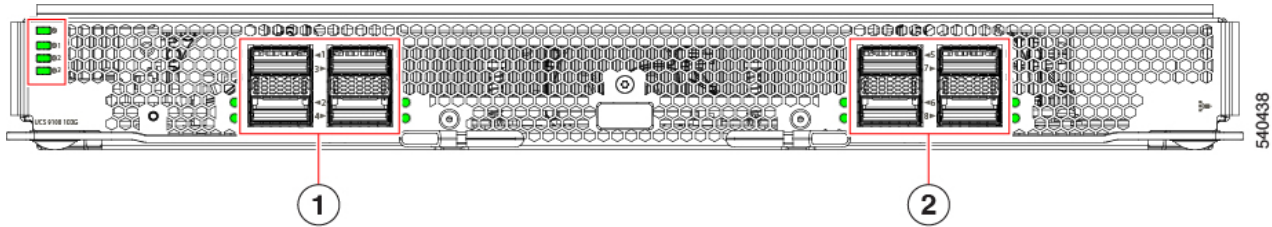| Product ID (PID)	Description
QSFP-100G-AOC30M	100GBASE QSFP Active Optical Cable, 30m

SUPPLEMENTAL MATERIAL

Port Numbering

Each port on the Cisco UCS 9108 100G IFM is numbered. The ports are numbered left to right.

Figure 3 shows how ports are numbered and the table below explains how each port functions.

Figure 3   Port Numbering of the Cisco UCS 9108 100G IFM

1	Port 1-4 (operate as 100 Gbps QSFP28 fabric ports)	2	Port 5-8 (operate as 100 Gbps QSFP28 fabric ports)

Fabric Interconnect Compatibility

The Cisco UCS 9108 100G IFM is designed to work with the Cisco UCS 6536 Fabric Interconnects only.

Connectivity

This section shown the connectivity from the Cisco UCS 9108 100G IFMs to an external Fabric Interconnect (FI).

The connectivity from the IFMs 100G to 6536 series Fabric Interconnects is shown in *Figure 4*.

Figure 4   IFMs 100G to 6536 Series Fabric Interconnect Connectivity

= QSFP28 Links
1600G Per X9508 Chassis
100G E2E single-flow
200G Per x210 with 1:1 oversubsription

IFM A-100G (8 x 100GB)
IFM B-100G (8 x 100GB)

IFM A

IFM B
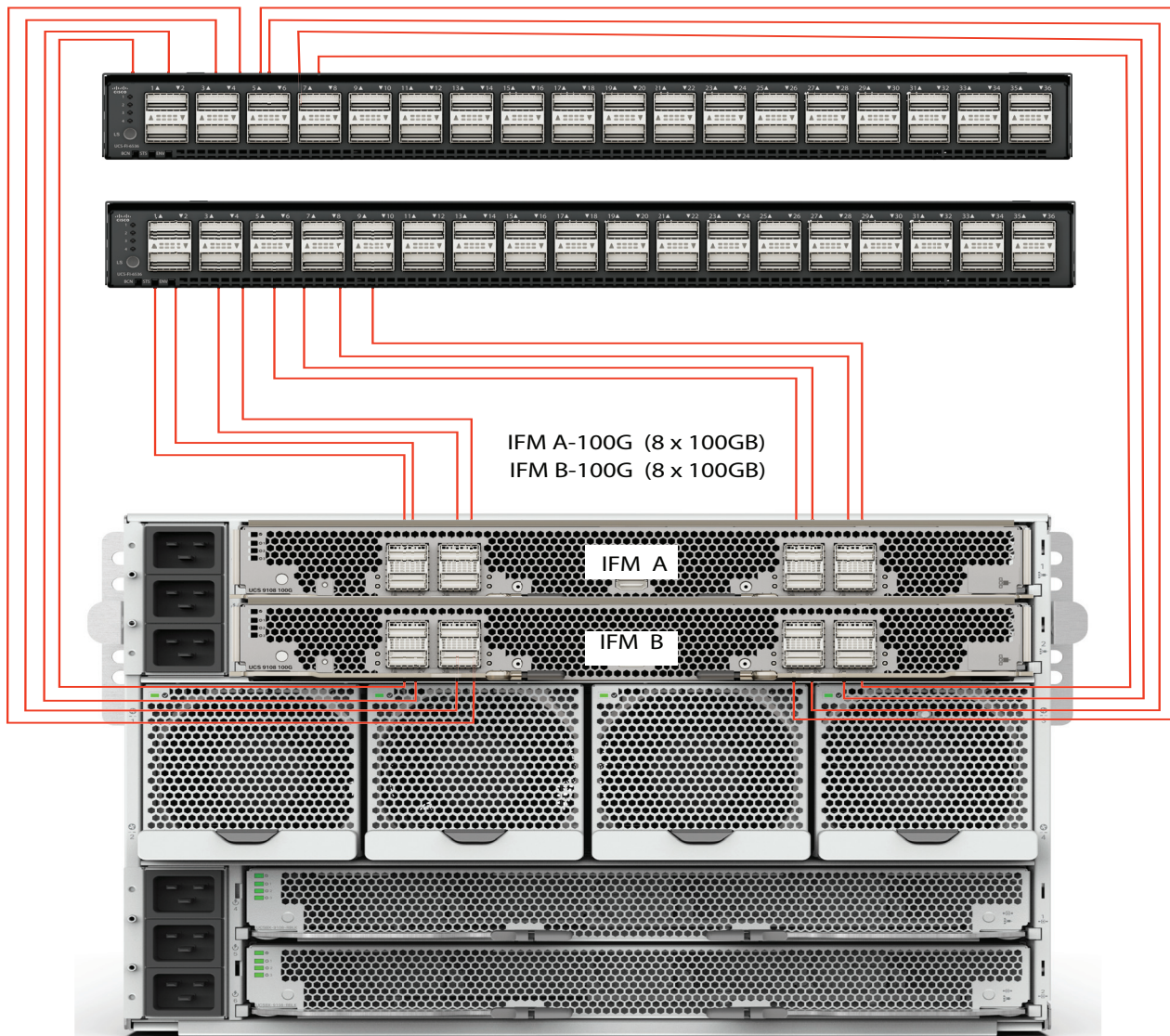
TECHNICAL SPECIFICATIONS

Physical and Environmental Specifications

Table 5   Physical and Environmental Specifications

Description	Specification
Cisco UCS 9108 100G IFM	
Dimensions (H x W x D)	1.67 in, x 14.93 in x 11.76 in. (4.2 cm x 37.9 cm x 29.9 cm)
Weight	8.42 lb (3.82 kg)
Temperature, operating	32 to 104°F (0 to 40°C)
Temperature, non-operating	-40 to 158°F (-40 to 70°C)
Humidity (RH), non-condensing	5 to 95%
Altitude	0 to 13,123 ft (0 to 4000 m)